

## CLAIMS

1. A purification catalyst for exhaust gas, comprising an aluminum oxide supporting Pd, wherein the aluminum oxide is  $\text{LnAlO}_3$  in which Ln is a rare-earth metal.
2. The purification catalyst for exhaust gas according to claim 1, wherein the aluminum oxide is trigonal or rhombohedral.
3. The purification catalyst for exhaust gas according to claim 1, wherein the catalyst is produced by adding at least one kind of compound selected from the group of compounds of carboxylic acid having a hydroxyl group or a mercapto group and having a carbon number of 2 to 20, dicarboxylic acid having a carbon number of 2 or 3, and monocarboxylic acid having a carbon number of 1 to 20 to aqueous nitrate solution including a component.
4. The purification catalyst for exhaust gas according to claim 3, wherein the catalyst is produced by evaporating the aqueous nitrate solution completely, to produce a carboxylic acid complex polymer and heating the carboxylic acid complex polymer.
5. The purification catalyst for exhaust gas according to claim 2, wherein Pd is supported on  $\text{LnAlO}_3$  in which Ln is a rare-earth metal, and an oxidation state of Pd in a surface supporting Pd is a state of  $\text{Pd}^{2+}$ .

6. A production method for a purification catalyst for exhaust gas, the method comprising:

preparing at least one kind of compound selected from a group of compounds of carboxylic acid having a hydroxyl group or a mercapto group and having a carbon number of 2 to 20, dicarboxylic acid having a carbon number of 2 or 3, and monocarboxylic acid having a carbon number of 1 to 20; and

adding at least one compound selected from the group to an aqueous nitrate solution including a component.

7. The production method for a purification catalyst for exhaust gas according to claim 6, the method comprising:

evaporating aqueous carboxylic acid completely to produce a carboxylic acid complex polymer; and

heating the carboxylic acid complex polymer.

8. The production method for a purification catalyst for exhaust gas according to claim 7, wherein a heating temperature in the heating of the carboxylic acid complex polymer is not more than 1000°C.

9. Purification catalyst equipment for exhaust gas, comprising the purification catalyst for exhaust gas according to claim 1.